

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 06-156764

(43)Date of publication of application : 03.06.1994

(51)Int.Cl.

B65H 3/06

B65H 1/12

G03G 15/00

(21)Application number : 04-332574

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(22)Date of filing : 18.11.1992

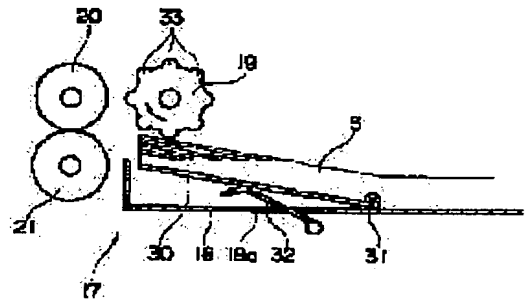
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(54) PAPER FEEDING DEVICE

(57)Abstract:

PURPOSE: To provide a paper feeding device which prevents the reduction of the combing effect without increasing cost.

CONSTITUTION: On the outer periphery of a pick-up roller 19, projection parts 33 having a uniform height over in the lengthwise direction are installed in the nearly equal intervals in plural stages, and the outer periphery of the pick-up roller 19 is formed into an uneven surface. A bottom plate 30 is made of the elastic material. A piled sheet S is placed on the bottom plate 30, and is pushed on the pick-up roller 19 by pushing up the bottom plate 30, and the pick-up roller 18 is revolved to apply vibration to the piled sheet S, and the sheets are driven out successively, and transported one by one, separated by a feeding roller 20 and a retarding roller 21.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

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CLAIMS

[Claim(s)]

[Claim 1] Feed equipment which becomes considering the periphery of said pickup roller as a concave convex in the feed equipment which presses a loading sheet against a pickup roller, rotates the pickup roller, and lets out a sheet in order.

[Claim 2] Feed equipment which comes to make said bottom plate from a spring material in the feed equipment according to claim 1 which lays said loading sheet on a bottom plate, pushes up the bottom plate, and presses said loading sheet against said pickup roller.

[Claim 3] Feed equipment which comes to prepare an elastic member in said bottom plate part to said pickup roller which presses and corresponds with a location in the feed equipment according to claim 1 which lays said loading sheet on a bottom plate, pushes up the bottom plate, and presses said loading sheet against said pickup roller.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention can be applied to recording devices which record on a sheet by printing, an imprint, a copy, printing, etc., such as for example, a laser beam printer, a copying machine, facsimile, etc. It is related with the feed equipment which presses a loading sheet against a pickup roller, rotates the pickup roller in such a recording device in detail, and lets out a sheet in order.

[0002]

[Description of the Prior Art] There was a thing lets out a sheet in order and it was made to separate, setting spacing for two or more rollers on the periphery of ***** which has an elastic hub to this former and kind feeding equipment, attaching by insertion, making an axis into the axis of ***** and this direction, making some each [that] roller project from the periphery of ***** , pressing that ***** against a loading sheet, and making said roller draw inside ***** by bending of a hub. (Refer to JP,53-129649,A)

[0003] Moreover, the body of revolution which has the elastic piece of the direction of a path was made from the spring material, and there was a thing presses against a loading sheet, lets out a sheet and it was made to separate, rotating the body of revolution and sagging an elastic piece. (Refer to JP,61-52651,U and JP,60-258042,A)

[0004]

[Problem(s) to be Solved by the Invention] However, since the feed equipment which prepared ***** which has two or more rollers had the complicated structure of ***** , it had the fault that the cost of equipment became high. Moreover, some which prepared the body of revolution which has an elastic piece in the periphery had the fault that a permanent set in fatigue arose in the elastic piece pressed against a sheet, and the **** effectiveness fell to it gradually.

[0005] Then, the purpose of this invention is to offer the feed equipment with which the **** effectiveness does not fall, without cost becoming high.

[0006]

[Means for Solving the Problem] Therefore, this invention is characterized by what is become considering the periphery of said pickup roller 19 as a concave convex in the feed equipment 17 which presses the loading sheet S against a pickup roller 19, rotates that pickup roller 19 like the following illustration examples, and lets out Sheet S in order.

[0007] A thing according to claim 2 is characterized by the thing it comes to make said bottom plate 30 from a spring material in the feed equipment 17 according to claim 1 which lays said loading sheet S on a bottom plate 30, pushes up the bottom plate 30 like the following illustration examples, and presses said loading sheet S against said pickup roller 19.

[0008] Moreover, a thing according to claim 3 is characterized by the thing it comes to prepare an elastic member 35 in location and corresponding said bottom plate partial 30a to said pickup roller 19 by pressing in the feed equipment 17 according to claim 1 which lays said loading sheet S on a bottom plate 30, pushes up the bottom plate 30 like the following illustration examples, and presses said loading sheet S against said pickup roller 19.

[0009]

[Function] And when letting out Sheet S, the loading sheet S is pressed against the concave convex of a pickup roller 19, a pickup roller 19 is rotated, vibration is given to the loading sheet S, and it lets out Sheet S in order.

[0010] The loading sheet S corresponds to the concave convex of a pickup roller 19, a bottom plate 30 corresponds to a concave convex at the time of push this slack, and it is bent by the thing according to claim 2.

[0011] Moreover, in a thing according to claim 3, the loading sheet S corresponds to the concave convex of a pickup roller 19, an elastic member 35 corresponds to a concave convex at the time of push this slack, and elastic deformation is carried out.

[0012]

[Example] Hereafter, it attaches and explains to the example of this invention, referring to a drawing. Drawing 5 is the whole outline block diagram showing the internal device of a laser beam printer equipped with the feed equipment which is one example of this invention. The sign 10 in drawing is a body of equipment. the body 10 of equipment -- the -- it has a photo conductor 11 in the center mostly, and comes to arrange sequential electrification

machine 12, write-in [optical] vessel 13, development counter 14, imprint machine 15, and the cleaning machine 16 around the photo conductor 11

[0013] And with the rotation to the clockwise rotation in drawing of a photo conductor 11, photo conductor 11 front face is uniformly charged with the electrification vessel 12, subsequently a laser beam is irradiated with the vessel 13 write-in [optical], an electrostatic latent image is formed, with a development counter 14, a toner is adhered and it is formed into a visible image.

[0014] On the other hand, the feed equipment 17 of this invention is formed in the transverse-plane bottom (under drawing Nakamigi) of the body 10 of equipment. To feed equipment 17, a pickup roller 19, and the feed roller 20 and Rita-****-** 21 which arrange up and down and make a pair are arranged. and a sheet paper cassette 18 to the pickup roller 19 attached in the body 10 of equipment free [attachment and detachment] -- Sheet S -- letting out -- a feed roller 20 and Rita-****-** 21 -- every one sheet -- conveying -- a resist roller pair -- it dashes against 22 and stops. Then, timing is doubled with rotation of a photo conductor 11, the resist roller 22 is rotated, Sheet S is conveyed, and the visible image of photo conductor 11 front face is imprinted on the sheet S with the imprint vessel 15.

[0015] And the sheet S after an image imprint is conveyed to a fixing assembly 23, and a transfer picture is established by the fixing assembly 23, and it discharges to a delivery unit 25 through the delivery way 24 the back. Moreover, the front face of the photo conductor 11 after an image imprint is cleaned with the cleaning vessel 16.

[0016] By the way, as shown in drawing 1 , feed equipment 17 uses as the supporting point the shaft 31 which formed the bottom plate 30 made from the spring material in the sheet paper cassette 18 ranging from the center of the die-length direction of a sheet paper cassette 18 to the front end, and prepared the end face in the sheet paper cassette pars basilaris ossis occipitalis, and attaches it free [rotation]. Moreover, it presses against a bottom plate 30 from aperture 18a which formed the arm 32 which was clockwise energized among drawing with the spring which is not illustrated, and which can be rotated in the sheet paper cassette 18 bottom, and established the tip in the pars basilaris ossis occipitalis of a sheet paper cassette 18.

[0017] On the other hand, as shown in drawing 2 , a pickup roller 19 forms two or more lobes 33 of uniform height covering the die-length direction in abbreviation regular intervals, and makes the periphery of a pickup roller 19 a concave convex at a periphery.

[0018] And as shown in drawing 1 , Sheet S is loaded on a bottom plate 30, a bottom plate 30 is pushed up with an arm 32, and the loading sheet S is pressed against a pickup roller 19. A deer is carried out, a pickup roller 19 is rotated like ****, and it lets out Sheet S in order. Then, since the concave convex of a periphery attaches strength, and presses the loading sheet S and a bottom plate 30 bends periodically corresponding to it, the loading sheet S vibrates, the **** effectiveness is brought to Sheet S, and it becomes easy to separate Sheet S. And it dissociates by the feed roller 20 and Rita-****-** 21, and every one sheet of this sheet S is conveyed to *****-** 22.

[0019] In the aforementioned example, although the pickup roller 19 formed two or more lobes 33 over which it goes in the die-length direction at the periphery in abbreviation regular intervals and made them the concave convex, as shown in drawing 3 , it arranges two or more projections 34 on the whole periphery surface according to proper distribution, and is good for it also as a concave convex. And since the loading sheet S surely contacts a pickup roller 19 by one of the projections 34 at the time of push this slack, and vertical movement of a bottom plate is not made large beyond the need, here where the noise at the time of contact to a concave convex and a pickup roller 19 is reduced is made.

[0020] Moreover, in the aforementioned example, although the bottom plate 30 was made from the spring material, a bottom plate 30 may be made from hard material, and an elastic member may be prepared in location and corresponding bottom plate partial 30a to a pickup roller 19 by pressing. That is, as shown in drawing 4 , a bottom plate 30 is made with a metal plate, and an elastic member 35 like the Rabbah-sheet is attached in bottom plate partial 30a to a pickup roller 19 which presses and corresponds with a location by adhesion etc. And a loading sheet corresponds to the concave convex of a pickup roller, and an elastic member corresponds to a concave convex at the time of push this slack, and it enables it to carry out elastic deformation, and to heighten the **** effectiveness of a sheet more, without vibrating the bottom plate itself. Moreover, the **** effectiveness when the front end of Sheet S is carried and loaded on an elastic member 35, the frictional force of the loading sheet S and a bottom plate 30 is heightened and the remainder of the loading sheet S decreases is heightened.

[0021]

[Effect of the Invention] Therefore, according to this invention, since it is the easy configuration which makes the periphery of a pickup roller a concave convex, cost does not become high. Moreover, since the periphery of a pickup roller is a mere concave convex, the feed equipment with which a permanent set in fatigue etc. does not occur in a pickup roller, and the **** effectiveness does not fall can be offered.

[0022] According to the thing according to claim 2, a loading sheet corresponds to the concave convex of a pickup roller, a bottom plate corresponds to a concave convex at the time of push this slack, since it bends, with rotation of a pickup roller, a bottom plate vibrates and the **** effectiveness of a sheet can be heightened more.

[0023] Moreover, according to the thing according to claim 3, a loading sheet corresponds to the concave convex of a pickup roller, an elastic member corresponds to a concave convex at the time of push this slack, since elastic deformation is carried out, without vibrating the bottom plate itself, a loading sheet can be shaken and the ****

effectiveness of a sheet can be heightened more.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the outline block diagram of the feed equipment which is one example of this invention.

[Drawing 2] It is the perspective view of the pickup roller.

[Drawing 3] It is the perspective view showing the other examples of a pickup roller.

[Drawing 4] It is the state diagram which loaded the sheet into the bottom plate in other examples of this invention, and was pressed against the pickup roller.

[Drawing 5] It is the outline block diagram of a laser beam printer equipped with such feed equipment.

[Description of Notations]

17 Feed Equipment

18 Sheet Paper Cassette

19 Pickup Roller

30 Bottom Plate

30a Bottom plate part

35 Elastic Member

S Sheet

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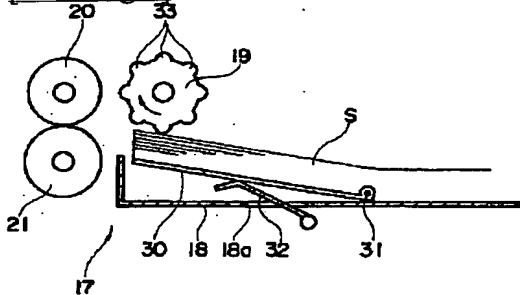
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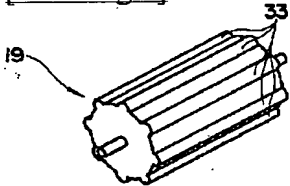
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DRAWINGS

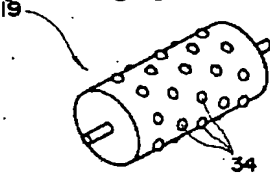
[Drawing 1]



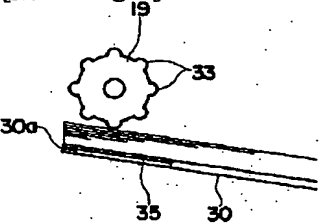
[Drawing 2]



[Drawing 3]



[Drawing 4]



[Drawing 5]

